

Comparison of classical and anchorage methods in sacrospinous ligament fixation

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ABSTRACT

Aims: Pelvic organ prolapse (POP) is a common condition that affects the quality of life in women. As a natural consequence of the aging population, it is believed that POP will increase in the next 40 years. With the increase in life expectancy, there is an expected rise in reconstructive surgical procedures to correct pelvic floor disorders. POP can occur in three vaginal compartments: anterior, apical, and posterior. The apical compartment includes uterine prolapse, cervix, or vaginal cuff prolapse. Our primary objective was to compare the surgical outcomes of the method using the classic technique with pelvic floor anchorage (anchoring).

Methods: This retrospective cohort study consisted of women with POP-Q (Pelvic Organ Prolapse Quarejment) grade 2 and above in the apical compartment. In the sample size calculation, G power analysis was performed with α : 0.05 and 80% accuracy. Forty-eight women were included in the study, with 24 of them undergoing the classic method and the other 24 receiving sacrospinous ligament fixation (SSLF) using a pelvic floor anchoring device. The results of both surgical methods were compared in terms of anatomical recurrence.

Results: There was no statistically significant difference observed between the postoperative measurements of the C points. However, the difference in the C level between preoperative and postoperative measurements for patients who underwent the classic SSLF operation was statistically significantly higher compared to those who underwent the Anchorage SSLF procedure.

Conclusion: When comparing the classic and anchoring systems for the SSLF procedure, no difference was observed in terms of recurrence. However, the classic method was found to be more successful in restoring apical prolapse.

Keywords: Apical prolapse, SSLF, pelvic organ prolapse

INTRODUCTION

Pelvic organ prolapse (POP) is a common condition that affects the quality of life in women.¹ As a natural consequence of the aging population, it is believed that POP will increase in the next 40 years.² With the increase in life expectancy, there is an expected rise in reconstructive surgical procedures to correct pelvic floor disorders. POP can occur in three vaginal compartments: anterior, apical, and posterior. The apical compartment includes uterine prolapse, cervix, or vaginal cuff prolapse.³ Apical and anterior prolapse often coexist, making apical restoration important during the correction of anterior prolapse.⁴ Sacrospinous ligament fixation (SSLF) has been described as a vaginal approach for apical prolapse restoration. In the classic traditional posterior approach, along with the advantages of repairing defects like cystocele, rectocele, enterocele, it carries the risks of pudendal nerve

injuries, vascular injuries, dyspareunia, chronic pelvic pain, and postoperative de novo recurrence in the anterior compartment.⁵

After the ban on the use of vaginal meshes by the FDA in 2019, there has been a renewed interest in natural tissue repair with SSLF.⁶ In this study, our primary objective was to compare the surgical outcomes of the method using the classic technique with pelvic floor anchorage (anchoring).

METHODS

The study was carried out with the permission of of the Prof. Dr. Cemil Taşcıoğlu City Hospital Ethics Committee (Date: 26.12.2022, Decision No: 368). All procedures

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were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

This retrospective cohort study consisted of women with POP-Q (Pelvic Organ Prolapse Quarejment) grade 2 and above in the apical compartment, treated at a tertiary center between April 2020 and July 2022. Forty-eight women were included in the study, with 24 of them undergoing the classic method and the other 24 receiving sacrospinous ligament fixation (SSLF) using a pelvic floor anchoring device. Patients with emergency cases, malignancy, immunodeficiency, or connective tissue diseases were excluded from the study. Demographic data and characteristic features of the patients were recorded. The comparison of both methods included the start and end times of anesthesia (surgery duration) in the operating room, intraoperative blood loss, and perioperative complications, which were added to the patient data. Complications were classified according to the Clavien-Dindo classification. All operations were performed by the same surgical team.

Postoperative surgical failure was evaluated by independent surgeons, not part of the operating team, using the POP-Q system. Anatomical anterior compartment recurrence was defined as $\geq$ stage II (Aa or Ba $\geq$ -1 cm), apical prolapse relapse as $\geq$ stage II (C $\geq$ -1 cm), and posterior vaginal wall prolapse as $\geq$ stage II (Ap or Bp $\geq$ -1 cm). Postoperative follow-up was scheduled routinely at the first year, postoperative 6th and 12th months, and then annually thereafter.

Surgical Operation Methods

Classic SSLF: Following the infiltration of the posterior vaginal wall, the pararectal space was dissected by deviating the rectum to the right after an incision in the mid-lower third of the vagina. The surgeries were performed unilaterally. After the sacrospinous ligament was dissected from the connective tissue, it was sutured to the apex of the vagina with a non-absorbable permanent suture. Depending on the surgeon's decision, anterior and/or posterior colporrhaphy was performed for patients with cystocele or rectocele.

Anchorage SSLF: Following the infiltration of the posterior vaginal wall, the pararectal space was dissected by deviating the rectum to the right after an incision in the mid-lower third of the vagina. The connective tissue over the sacrospinous ligament was dissected, and then the sacrospinous ligament was fixed using a pelvic floor anchoring device. The unique non-absorbable permanent suture from the device was used to suture the vaginal apex. The surgery was performed unilaterally. Depending on the surgeon's decision, anterior and/or posterior colporrhaphy was performed for patients with cystocele or rectocele.

Statistical Method

SPSS 15.0 for Windows software was used for statistical analysis. Descriptive statistics were presented as follows: for categorical variables, counts and percentages were used, and for numerical variables, mean, standard deviation, median, minimum, and maximum values were provided. Chi-square test was used to compare proportions between groups. For

independent two-group comparisons of numerical variables, Student t-test was used when the normal distribution assumption was met, and Mann-Whitney U test was used when the assumption was not met. The significance level (alpha) was set at $p < 0.05$.

RESULTS

In the Classic SSLF and Anchorage SSLF groups, the mean age was 59.8 ± 6.3 and 60.0 ± 6.5 , respectively. There were no statistically significant differences in demographic and characteristic features between the two groups of patients who underwent the two types of surgeries (Table 1).

	Classic	Anchorage	p
Age; Mean $\pm$ SD (min-max)	59.8 $\pm$ 6.3 (48-69)	60.0 $\pm$ 6.5 (49-71)	0.929*
BMI; Mean $\pm$ SD (min-max)	27.6 $\pm$ 1.4 (25-30)	28.0 $\pm$ 1.0 (26-30)	0.238#
Smoker; n (%)	7 (29.2)	10 (41.7)	0.365£
Systemic disease; n (%)	None	7 (29.2)	0.642£
	DM	1 (4.2)	
	HT	9 (37.5)	
	CAD	2 (8.3)	
	COPD	1 (4.2)	
Menopause Duration (years); Mean $\pm$ SD (min-max)	13.0 $\pm$ 6.5 (2-22)	16.0 $\pm$ 5.8 (4-26)	0.094*

*Student t Test #Mann Whitney U test £ Chi-square test
(BMI: body mass index, DM: Diabetes mellitus, CAD: Coronary Artery disease, HT: Hypertension, COPD: Chronic Obstructive pulmonary disease)

Between the two surgical procedures, there was no difference observed in terms of hospitalization duration. The average surgery duration for patients who underwent the classic SSLF operation was 80 minutes, which was significantly longer than those who underwent the Anchorage SSLF procedure ($p < 0.001$). Regarding complications, no Grade $>3b$ complications were observed according to the Clavien-Dindo classification in our study. In the classic SSLF group, 3 patients experienced dyspareunia, 2 patients had gluteal area paresthesia, and 1 patient had ischiorectal area hematoma. In the Anchorage SSLF group, 2 patients developed gluteal area paresthesia. The median follow-up duration for the patients was 12 months. The recurrence rate in both groups was 16.7%, and there was no statistically significant difference. The findings are summarized in Table 2.

Both surgeries' Ba, C, and Bp points according to the POP-Q scale are summarized in Table 3. There was no statistically significant difference observed between the postoperative measurements of the C points. However, the difference in the C level between preoperative and postoperative measurements for patients who underwent the classic SSLF operation was statistically significantly higher compared to those who underwent the Anchorage SSLF procedure.

Table 2. Surgical Characteristics

		Performed surgery		p
		Classic SSLF	Anchorage SSLF	
Additional Operations; n (%)	CA	21 (87.5%)	22 (91.7%)	-
	CA+CP	3 (12.5%)	2 (8.3%)	
Surgery duration in minutes; Mean±SD (min-max)		80 (45-105)	32.5 (30-65)	<0.001#
Estimated bleeding amount in ml; Mean±SD (min-max)		80 (50-95)	80 (60-200)	0.059#
Intraoperative/postoperative complication(s); n (%)	None	18 (75%)	22 (91.7%)	
	Hematoma	1 (4.2%)	0	
	Paresthesia	2 (8.3%)	2 (8.3%)	
	Dyspareunia	3 (12.5%)	0	
Follow-up period; median (min-max)		12 (7-16)	12 (4-16)	0.338
Relapse; n (%)		6 (25%)	6 (25%)	1.000
#Mann Whitney U test, CA: Anterior colpography, CP: Posterior colpography, SSLF: Sacrospinous ligament fixation				

Table 3. Preoperative and postoperative POP-Q measurements

		Classic SSLF	Anchorage SSLF	p#
		Median (min-max)	Median (min-max)	
Ba: cm	Pre-op	2.5 (1-6)	3 (1-6)	0.538
	Post-op	-2 (-3-3)	-2 (-3-3)	0.341
C	Pre-op	4.25 (2.5-7)	3 (1-5.5)	<0.001
	Post-op	-4.5 (-6-4)	-4 (-6-3)	0.288
Bp	Pre-op	2 (1-2)	2 (1-2)	0.118
	Post-op	-1.5 (-3-2)	-2 (-3-1)	0.327
#Mann Whitney U test				

DISCUSSION

The results of SSLF procedures may vary; however, they are frequently used for the restoration of apical prolapse. In a randomized study conducted in Denmark in 2019, the follow-up results of SSLF operations for apical prolapse showed recurrence in 32% of the patients after a 5-year follow-up.⁷ A meta-analysis conducted by Coolen et al.⁸ reported recurrence rates ranging from 35% to 81%. In a study by Wu CJ and colleagues in Taiwan, the one-year objective cure rate was found to be 82.5%.⁹ In our study, the recurrence rates for both methods were similar at the one-year follow-up (25%). A similar Swedish study comparing the anchorage method with classic SSLF showed that relapse symptoms and the number of reoperated patients were slightly more common in the anchorage technique; the one-year asymptomatic period in the anchorage and classic methods were observed at 71.5% and 78.7%, respectively. However, patient satisfaction was similar in both groups.¹⁰ In other studies, when the pelvic floor anchorage technique was used for SSLF, objective success rates ranged from 67% to 95%.^{11,12}

Although studies related to SSLF show differences in methods, techniques, and surgical procedures, in a comparison between

unilateral and bilateral SSLF, it was reported that two patients (3.84%) in the unilateral group experienced vaginal cuff prolapse recurrence, while no recurrence was observed in the bilateral SSLF group.¹³ Another study on apical prolapse showed that in patients with a genital hiatus larger than 4 cm, cuff prolapse recurrence could be anticipated.¹⁴ While rare, SSLF can have serious intraoperative and postoperative complications. The most common complication is bleeding due to pudendal vessel injuries. Other complications include pudendal and sciatic nerve injuries, bladder injuries, gluteal pain, and suture abscesses.^{15,16} In our study, in the classic SSLF group, 3 patients experienced dyspareunia, 2 patients had gluteal area paresthesia, and 1 patient had an ischiorectal area hematoma. In the Anchorage SSLF group, 2 patients developed gluteal area paresthesia. These complications were not severe and resolved within the following weeks with analgesics. In a meta-analysis study involving 4,120 cases, it was observed that abdominal sacrocolpopexy (ASC) had a higher success rate and lower recurrence rate compared to SSLF. Patients who underwent SSLF had more postoperative dyspareunia. SSLF cases showed shorter surgery duration, minimal bleeding, fewer gastrointestinal complications, and fewer wound infections compared to ASC cases.¹⁷ Apical prolapse patients or those undergoing SSLF, particularly in older ages with comorbidities and potential complications related to general anesthesia, were shown to benefit from SSLF performed under local anesthesia.¹⁸ This approach offers a significant advantage for patients who cannot undergo general anesthesia and have cuff prolapse.

In a study conducted by Salman et al.,¹³ using anchorage technique for SSLF, the average surgery duration was 76.6±10.7 minutes for unilateral cases and 80.5±11.8 minutes for bilateral cases. In another study involving 55 patients, a prospective cohort study with classic SSLF reported a surgery duration of 60 minutes (ranging from 20 to 165 minutes).¹⁹ In another study using anchorage for SSLF, the average surgery duration was 40 minutes (ranging from 20 to 90 minutes).²⁰ In our study, the surgery duration for unilateral classic SSLF was 80 minutes (ranging from 45 to 105 minutes), while for unilateral SSLF with Anchorage, it was 32.5 minutes (ranging from 30 to 65 minutes). The presence of additional conditions such as simultaneous cystocele, rectocele, or incontinence problems in the patients may have contributed to the longer surgery duration. However, regardless of these additional procedures, the use of anchorage in SSLF significantly reduces the surgery duration.

When looking at the studies, it can be observed that there are similar recurrence and complication rates, as well as studies showing higher recurrence and complication rates. The reason for this could be the lack of a standardized protocol for SSLF. This indicates that there is a surgical learning curve for SSLF, and the surgeon's experience is crucial. The limitations of the study were a relatively small patient cohort and a short follow-up duration. In the future, prospective studies with larger patient cohorts and longer follow-up periods for apical prolapse in SSLF would be more beneficial.

CONCLUSION

When comparing the classic and anchoring systems for the SSLF procedure, no difference was observed in terms of recurrence. However, the classic method was found to be more successful in restoring apical prolapse.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of the Prof. Dr. Cemil Taşcıoğlu City Hospital Ethics Committee (Date:26.12.2022, Decision No: 368).

Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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